19. Sketch the mechanism of the following:

(a) Baeyer – Villiger rearrangement

(b) Von Richter rearrangement.

(c) Stevens rearrangement.

20. (a) Explain the basic principle and Instrumentation of HPLC.

(b) What is fractional crystallisation? Explain its basic principle.

APRIL/MAY 2025

GCH41/DCH41 – ORGANIC CHEMISTRY IV

Shanmuga Industries Arts & Science College T.V.Malai

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. What is meant by retro synthetic analysis?

2. Provide the importance of DCC. Catalyst.

3. State isoprene rule.

4. What are alkaloids? Give an example.

5. Draw the structure of any one tripeptides.

6. What is the fourth stage of cholesterol biosynthesis?

7. Writ the utility of Favorski rearrangement.

8. Ring expansion can occur in Demjanov rearrangement. Explain.

9. Mention any two advantages of hydrogen used as a carrier gas in GC.

10. Define the term distillation.

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Discuss an important method employed for protection and deprotection of carboxyl group in retro synthesis.

Or

(b) Give a brief account on,

(i) Robinson annelation,

(ii) Umpolung synthesis.

12. (a) Outline the structural determination of α- pinine.

Or

(b) Explain the basic steps in biosynthesis of morphine.

13. (a) Suggest any one method of synthesis of tripeptides.

Or

(b) Write the importance of DNA and outline its functions in the biological system.

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14. (a) Discuss the mechanism of Dienone-phenol rearrangement. Prove whether the rearrangement is Intra- or Inter molecular.

Or

(b) Give the mechanism of Sommelet reaction.

15. (a) Give the principle and applications of Gas chromatography.

Or

(a) Explain the principle involved in.

(i) Steam distillation

(ii) Vacuum distillation

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. (a) Explain the uses of phosphorus and sulphur ylides in organic synthesis.

(b) Discuss how 1,3-dithiane is useful to a synthetic organic chemist. Give examples.

17. Write down the total synthesis of reserpine.

18. Summarize the tertiary structure of proteins.